

REMARKS

Claims 12-19 are pending in this application. The drawings are objected to for failing to show every feature of the claims. Claims 12-16 are rejected under 35 USC 102(b) as being anticipated by Montgomerie. Claim 17 is rejected under 35 USC 103(a) as being unpatentable over Montgomerie in view of Sandberg or Keyes.

Applicant's Response to Drawing Objections

Examiner objected to the drawings under 37 C.F.R. 1.83(a). Specifically, that the claimed subject matter of sublayers, a heat source, a boiler, and a steam turbine must be shown in the drawings or removed from the claims 13, 14, and 18.

Applicant has submitted corrected figure 1 showing a first outer layer 7, sublayers 7a and 7b, an inner layer 9, and sublayers 9a and 9b. Applicant has submitted corrected figure 2 showing a heat source, a boiler, and a steam turbine.

In addition, Applicant has submitted new figure 3 showing the region 32 and remaining region 31 claimed in amended claims 17, 18, and 21.

No new matter has been added by these changes.

Applicant's Amendments to the Specification

Applicant has amended paragraph [0034] to include a description of the items added to figure 2 which previously had been claimed but not shown in the drawings, in response to Examiner's objection. Applicant has further amended paragraph [0034] by adding a brief description of new figure 3. Applicant has amended paragraph [0035] to include a description of the items added to figure 1 which previously had been claimed but not shown in the drawings, in response to Examiner's objection. Applicant has amended paragraph [0039] to include reference numbers for items previously supported by paragraph [0039], but not claimed until this amendment, which must now be included in the drawings because they are now being claimed.

No new matter has been added by these changes.

Applicant's Response to 35 USC 102(b) Rejections

Claims 12-16 stand rejected under 35 U.S.C. 102(b) as being anticipated by Montgomerie et al. (GB 1,042,386). The Applicant requests reconsideration and withdrawal of these rejections since each of these rejected claims includes a limitation that is not taught in the cited prior art reference. In particular, each of Applicant's rejected claims includes a limitation directed to a second biocidal layer arranged on the inside surface of the tube. (See independent claims 12 and 16.) In contrast, the '386 patent to Montgomerie recites "A fluorocarbon synthetic resin material... a suitable synthetic resin material for this purpose is pol[y]tetrafluoroethylene (hereinafter referred to as p.t.f.e.)" (See column 1, lines 14-22.) Applicant claims a "biocidal layer" for the inner surface coating material, while the '386 patent teaches a fluorocarbon synthetic material for both the inner and outer surface coatings. There is no teaching or suggestion in Montgomerie '386 or the art that fluorocarbon synthetic materials are biocides. MPEP §2131 provides that a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. The identical invention must be shown in as complete detail as contained in the claim. The Examiner has not established that the prior art teaches a biocidal layer in a heat exchanger tube. In fact, Applicant has realized that the fluorocarbon synthetic material (p.t.f.e.) is effective on the first, outside surface, to reduce surface tension, as taught by the prior art, but that it is not as effective on the second, inside surface, and therefore has specifically claimed a biocidal coating instead of the fluorocarbon synthetic material taught by the prior art.

Examiner further rejects claims 13 and 14 as being anticipated again by Montgomerie et al. (GB 1,042,386). Examiner states that Montgomerie '386 discloses a layer that includes a plurality of sub-layers, at column 2, lines 1-53. Applicant respectfully submits that Montgomerie '386 discloses only a single layer. In Montgomerie '386, the single layer is formed by dispersing a fluorocarbon synthetic material to a porous surface, which may absorb some or all of the fluorocarbon synthetic material. That fluorocarbon synthetic material is subsequently united, through a process such as sintering. The resulting layer is a single layer composed of a porous surface and the united fluorocarbon synthetic material. (See lines 37-52). In contrast, in claim 13, Applicant claims layers "wherein the first layer or the second layer are formed by a plurality of sub-layers." Thus, in addition to the missing limitation in claim 12 discussed above, Montgomerie '386 teaches a single layer, composed of two materials, while Applicant claims a

layer composed of a plurality of sub-layers. Therefore, Montgomerie '386 does not teach the invention claimed in claim 13.

In claim 14, Applicant claims "The heat exchanger tube... wherein the first or second layer of the heat exchanger tube are coatings and each coating is produced differently from the other." (Emphasis added). In contrast, Montgomerie '386 teaches the method described in the paragraph above for creating a first layer, and then teaches that "Where the coolant is likely to leave deposits of sludge and other foreign matter within the tubes, these may be coated with p.t.f.e. or the like internally as well." (See column 2, lines 65-69.) Montgomerie '386 teaches no *different* method for producing the internal coating. In addition to the missing limitation in claim 12 discussed above, Montgomerie '386 does not teach a different method of producing the internal coating, while Applicant's claim 14 states that each coating is produced differently. Therefore, Montgomerie '386 does not teach the invention claimed in claim 14.

Claim 15 depends from claim 14. Since Montgomerie '386 does not teach all of Applicant's limitations in claim 14, it does not teach all of the limitations in claim 15.

Accordingly, for the reasons discussed above, the rejection under 35 U.S.C § 102(b) for claims 12-16 is not supported by the art and Applicant requests that it be withdrawn.

Applicant's Response to 35 USC 103(a) Rejections

Claim 17 depends from claim 16 and stands rejected under 35 U.S.C. §103(a) as being unpatentable over Montgomerie in view of R.A. Sandberg (US 2,064,036) or Keyes (US 5,219,374). Examiner states that Montgomerie substantially discloses all of the Applicant's claimed invention except for the limitation that the tube contains a longitudinal welded seam on top of the tube. Examiner further notes that either Sandberg or Keyes teach a tube having a longitudinal welding seam located "at an upper most position of the tube cross section for a purpose of sealing the tube which is formed by bending a flat sheet of material." Applicant argues above that Montgomerie does not disclose all of the limitations of independent claim 16, and the Applicant will demonstrate below that the Montgomerie '386 patent together with either the Sandberg or the Keyes reference still do not teach all of Applicant's claim 17 limitations.

MPEP 2143 states,

To make a *prima facie* case of obviousness three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves,

or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations.

In claim 17 Applicant claims “the heat exchanger tube is [a] longitudinally welded tube having a weld seam running along a long axis of the tube...” The Examiner has admitted that the Montgomerie reference fails to teach this limitation. Sandberg ‘036 teaches forming tubes by rolling flat sheets, placing the tubes in a jig, inserting brazing wires longitudinally on top of the seams of the tubes, and placing the entire assembly in a brazing furnace. (See Sandberg ‘036 column 3 line 55 through column 4 line 35.) Thus Sandberg ‘036 teaches a uniform location for the braze seam during the brazing operation only. However, in claim 17 Applicant’s limitation further includes that “the tube is arranged in the assembled heat exchanger such that the tube weld seam is located at an upper most position of the tube cross section.” Applicant claims that the tube is to be oriented such that the weld is at the highest point in the tube when assembled. Thus, while Sandberg ‘036 teaches a uniform location for the braze seam during the brazing operation, it does not teach the orientation of the seam in the assembled heat exchanger, and it fails to correct the deficiency of the primary reference.

Similarly, Keyes ‘374 does not teach anything about the location of the welded seam in an assembled heat exchanger. In fact, Keyes ‘374 states that the tube “may be formed into a convenient size core for shipping to an exchanger making plant.” (See column 3, lines 30-33.) As a result, the seams in the Keyes ‘374 reference could end up in any orientation once assembled. Therefore, the combination of Montgomerie and either Sandberg or Keyes ‘374 does not teach Applicant’s claimed limitation about the orientation of the heat exchanger tubes in an installed heat exchanger, and the rejection under 35 U.S.C. 103(a) should be withdrawn.

In addition, in amended claim 17, Applicant adds the following claim language: “wherein there is a region proximate to the weld seam which is free of the second biocidal layer, and a remaining region on which the second biocidal layer is arranged, said remaining region being disposed remote from the weld seam.” This matter is supported by paragraphs 20-23, and 39 of the specification. Neither the Montgomerie ‘386 patent nor the Sandberg nor the Keyes reference teaches such a limitation as in Applicant’s amended claim 17. Therefore, Applicant requests Examiner remove any 35 U.S.C. 103(a) rejection of claim 17.

Independent claims 18 and dependent claim 19 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Montgomerie and Sandberg or Keyes as applied to claims 1 and 16 above, and further in view of Brown et al. (US 5,083,606).” Examiner notes that Brown ‘606, figures 2 and 5 further discloses a steam power heat exchanger system which comprises a heat source, a boiler, and a steam turbine. In claim 18 Applicant claims, among other things, “a plurality of heat exchanger tubes having a welded seam running along a long axis of the tube arranged in the assembled condenser such that the tube weld seam is located at an upper most position of the tube cross section...” Applicant further claims a “second biocidal layer...arranged on the inside surface of the tube” in claim 18. Applicant has also added claim language to claim 18: “wherein there is a region proximate to the weld seam which is free of the second biocidal layer, and a remaining region on which the second biocidal layer is arranged, said remaining region being disposed remote from the weld seam.” This matter is supported by paragraphs 20-23, and 39 of the specification. As argued above, neither the Montgomerie ‘386 patent nor the Sandberg nor the Keyes reference teaches any of these limitations. Without these elements, a prima facie case of obviousness cannot be established with respect to claim 18. Therefore, Applicant requests Examiner remove the 35 U.S.C. 103(a) obviousness rejection for claim 18.

Claim 19 has been cancelled herein.

New Claims:

Applicant has added the following new dependent claims 20-24:

In claims 20, 23, and 24 Applicant claims that the “second biocidal layer material comprises an organic silicate network” as supported by paragraphs 28, 36, and 37 of the specification.

In new claims 21 and 22, Applicant claims “a remaining region includes the inner surface of the tube starting at the tube’s three o’clock position and continuing to the tube’s nine o’clock position” as supported by paragraphs 20-23, and 39 of the specification.

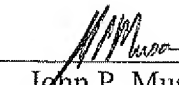
Conclusion

Reconsideration of the application and withdrawal of the rejections is respectfully requested.

Please grant any extensions of time required to enter this paper. The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including fees for additional claims and terminal disclaimer fee, or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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